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Scalenus Anticus Symptoms

It is evident that the problem of pain in the upper extremity frequently lacks satisfactory explanation. The term, "thoracic outlet syndrome," has been used to denote neurovascular compression at the exit of the brachial plexus and subclavian vessels from the isthmus of the root of the neck. Pain, numbness, tingling, vasospasm, and even gangrene have been attributed to neurovascular compression by such structures as a cervical rib, the scalenus anticus muscle, the scalenus medius muscle, a high first rib, anomalous fibrous bands, the subclavius muscle, and costoclavicular compression.

As early as 1935, it was stressed that scalenus anticus symptoms could occur when the anterior scalene muscle is hypertrophic or spastic, displacing the neurovascular structures of the thoracic outlet. Symptoms could be produced then by compression of the structures against the first rib without the presence of a cervical rib.

Cervical rib compression and scalenus anticus syndrome give an identical picture. Numbness, pain, and paresthesia are present in the fingers and hands. Patients are usually of the middle age group. The symptoms are more likely to be along the ulnar distribution of the forearm and hand. Abduction of the arm aggravates symptoms and obliterates the radial pulse as does the lifting of a weight or turning the head to the opposite side. Generally, it is accepted that many people presenting these symptoms without a cervical rib may be treated successfully by conservative methods aimed at relieving muscle spasm and pain.

A ruptured nucleus pulposus of the cervical spine may produce symptoms similar to those of scalenus anticus compression. In the former, however, extension of the neck, coughing, or sneezing may accentuate the pain. Arterial or venous compression does not occur with the herniated cervical disc, but spasm of the scalene muscles may be produced secondarily which further confuses the diagnostic problem. Pain from the herniated cervical disc more frequently radiates to the radial portion of the hand, shoulder, or precordium. Cervical osteoarthritis and the superior sulcus syndrome may also produce pain which is easily confused with that of scalenus anticus compression.

Successful treatment of the "thoracic outlet syndrome" depends on accurate localization of the compression and exact determination of the abnormal structures involved.

The authors present a review of 53 patients who have been subjected to anterior scalenotomy during the past 15 years for neurovascular compression symptoms of the upper extremity. Most of the patients had an anterior scalenotomy alone while the remaining ones had scalenotomy in conjunction with some other definitive procedure. Of the 42 patients who had evidence of nerve or artery compression, 80% received relief of symptoms. Of the 7 patients who

had evidence of subclavian vein compression, 6 received relief of symptoms. Cervical ribs were present in 12 patients, and the authors concluded that it is advisable to remove the cervical rib when symptoms attributable to neurovascular compression are present. Cervicodorsal sympathectomy with scalenotomy may be indicated in certain instances of arterial occlusion, thrombosis, or spasm. (Riddell, D.H., et al., *Scalenus Anticus Symptoms - Evaluation and Surgical Treatment: Surgery*, 47: 115-124, January 1960)

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Surgical Treatment of Angina Pectoris

Pain in angina pectoris is reported to be a manifestation of myocardial ischemia and the underlying mechanism seems to be a relative disproportion between demands of the heart for blood and the supply of blood through the coronary arteries. If the duration of ischemia is brief, as in angina pectoris, no permanent myocardial damage may occur or only microscopic foci of necrosis and fibrosis may result. On the other hand, complete occlusion or narrowing of one or more major coronary arteries and primary branches may occur without giving rise to cardiovascular signs or symptoms. Clinical signs and symptoms and occurrence of myocardial damage depend upon whether development of intramyocardial collateral circulation has kept pace with progressive arterial narrowing. From one set of autopsy studies, it was found that the most advanced and widespread involvement occurred in the hearts of patients who had clinically suffered from angina pectoris.

Current surgical attempts to improve myocardial circulation in cases of angina pectoris have been directed along two lines: (1) attempting to increase intramural coronary anastomosis, thereby providing more efficient and effective utilization of arterial blood available to the heart, and (2) increasing arterial flow both into the coronary arterial system and into available intramural collateral channels.

The Beck I operation—abrasion of the epicardium and lining of parietal pericardium, application of an inflammatory agent to these surfaces, partial occlusion of the coronary sinus where it enters the right atrium, and grafting of parietal pericardium and mediastinal fat to the surface of the heart—has as its chief function stimulation of development of intercoronary anastomosis. In a series of 347 patients who had undergone this operation, as reported by Beck, 295 were alive at the time of the report and 278 had good or excellent result.

Day and Lillehei recently have introduced a new procedure designed to utilize stimulation of hypoxia in development of intercoronary anastomosis. The technique consists of constructing an anastomosis of measured size between the main pulmonary artery and the left atrium.

In an attempt to bring extra cardiac blood to the myocardium, Vineberg introduced an operation which consists of freeing the internal mammary artery,

the end of which is introduced into the ventricular myocardium. Pericardial fat-pad grafts are applied to areas of the myocardium which have been denuded of epicardium by sharp dissection. Results of this procedure in 59 patients were reported by Vineberg in 1958, showing considerable relief in a high percentage of patients. Difficulties with thrombosis of the transplant and adequacy of extracardiac blood added to the coronary circulation are the two uncertainties which have at present prevented wide acceptance of this procedure.

As another means of bringing additional blood into the coronary circulation in patients with angina pectoris, the authors previously reported the technique of reestablishing blood flow through obstructed major coronary vessels by removal of the thickened atheromatous intima. Of the various types of clinical cases suffering from major coronary artery occlusion, it was believed that the most suitable group in which to apply this technique would be those patients with severe incapacitating angina without definite evidence of myocardial infarction. Results in 10 patients who received this operation are presented in the current report. Five deaths occurred during surgery or a few days later; the remaining five patients have improved as judged by their clinical course and by evaluation of the treadmill exercise test. (Longmire, W.P., Jr., Cannon, J.A., Kattus, A.A., *The Surgical Treatment of Angina Pectoris*: A.M.A. Arch. Int. Med., 104: 886-892, December 1959)

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Acute Surgical Abdomen in Childhood

Diagnosis of the acute surgical abdomen in children is difficult. A child's reaction to a disease process may differ from that of an adult. For example, vomiting occurs more readily and reaction to pain is variable. They often have diarrhea with a condition which in an adult is associated with constipation. High fever is common apart from acute infections. Localized tenderness and rigidity often are absent.

Examination of a child requires gentleness and cannot be hurried. Inspection is valuable. The hand palpating the abdomen should be warm, and the affected area approached last. Gentle palpation gives information that is completely lost to the heavy-handed.

Various tests which reveal physiologic status should be performed, but there should be no delay in establishing the diagnosis of the acute abdomen while waiting for multiple laboratory determinations. Urinalysis, in addition to other information, may give some clue to the state of hydration. The leucocyte count—although helpful—is not as reliable a guide in the acute abdomen of childhood as it is in adults. Abdominal roentgenograms assist in establishing the diagnosis of intestinal obstruction. By using the newer water-soluble

radiopaque materials instead of barium contrast, films can be obtained showing the exact site of obstruction.

A precise diagnosis is not always possible in children. When existence of an acute surgical abdomen is strongly suspected, exploratory laparotomy is indicated without delay.

NEWBORN INFANT

Omphalocele. Urgent repair is indicated because the sac may rupture and peritonitis result. Small defects are repaired as a primary procedure. In the case of large defects, it is preferable to mobilize skin flaps to cover the herniation and repair the muscular and fascial layers later when the abdominal cavity has enlarged.

Atresia and Stenosis of GI Tract. Atresia rarely occurs proximal to the papilla of Vater, and thus the vomitus usually is bile-stained. The degree of abdominal distention depends on the level of the atresia. Roentgenograms show the dilated bowel of intestinal obstruction. In stenosis, since intestinal obstruction is incomplete, symptoms appear later in life and are less severe.

Treatment of both atresia and stenosis is surgical, the technique varying with the site of obstruction, but a short-circuiting operation to bypass the obstruction is preferred. In atresia of the duodenum, duodenojejunostomy is preferable to gastroenterostomy. Since atresia or stenosis may be multiple, all of the bowel must be examined.

Meconium Ileus. Intestinal obstruction from impacted meconium presents a therapeutic problem in the newborn infant. It is a generalized disease associated with decreased or absent pancreatic exocrine activity. Obstruction is usually in the distal ileum.

Meconium ileus should be suspected at birth if the amniotic fluid is discolored or fetid, or if the abdomen is distended. Roentgenograms usually show dilated loops of bowel and a mottled or granular appearance in areas of concentration of the inspissated meconium. Occasionally, flecks of calcium are seen throughout the abdomen, indicating a peritonitis of fetal life.

The Mikulicz resection and double ileostomy or the ileostomy with end to side anastomosis of the proximal ileum seem to be the most effective procedures. In both operative procedures, pancreatic extract should be introduced into the ileum at the site of meconium obstruction.

Diaphragmatic Hernia. There are three recognized types: posterolateral (foramen of Bochdalek), hiatal, and retrosternal (foramen of Morgagni). Symptoms of dyspnea and cyanosis are noted shortly after birth. The affected side of the chest may not move and there may be a mediastinal shift to the normal side. Auscultation demonstrates distant or absent breath sounds, but peristaltic sounds are heard clearly. Roentgenograms of the chest and abdomen establish the diagnosis. Surgical repair is best done through an abdominal

incision. At times, it is necessary to leave a defect in the abdominal fascia and close the skin; later repair is similar to that of a large omphalocele.

Malrotation of the Intestine. When obstruction of the duodenum is present, symptoms and signs are similar to those in duodenal atresia. When volvulus occurs, the characteristic findings are pain, vomiting, toxemia, and abdominal distention.

Duodenal obstruction requires laparotomy and incision of the peritoneal folds that compress the duodenum. If volvulus is present, the bowel must be derotated. If it is nonviable, resection must be performed.

Imperforate Anus. This condition may be of several types, varying from a membranous diaphragm to complete absence of anus and rectum. Diagnosis is made by inspection at birth or when the child fails to pass meconium. If unrecognized, several days may elapse before distention and vomiting of intestinal obstruction indicate a defect.

If the lesion is membranous, incision followed by dilation is satisfactory. When the defect is 2 cm. or less from the skin surface, a perineal approach to the blind rectal segment with suture of the withdrawn pouch to the anal skin may be done. If the defect is more than 2 cm. from the skin surface, or if there is a fistula to the vagina in the female or to the urinary tract in the male, a combined abdomino-perineal approach may be used. However, under these circumstances many surgeons prefer a temporary transverse colostomy, delaying definitive repair until the child weighs 15 to 25 pounds. Injudicious operations which damage the sphincter can result in an anal cripple.

Congenital Hypertrophic Pyloric Stenosis. This is the most common abdominal emergency encountered in the neonatal period. The Ramstedt operation with separation of the hypertrophied pyloric muscle down to the submucosa is the procedure of choice. Results are uniformly good.

FIRST YEAR OF LIFE

Intussusception. Occasionally, a Meckel's diverticulum, polyp, or hypertrophied lymph node may be found at the starting point. Onset is abrupt and the discomfort is paroxysmal with episodes continuing at 15 to 20-minute intervals. Rectal bleeding—"currant jelly stool"—is common. Palpation may reveal a sausage-shaped mass.

Barium has been used to reduce intussusception and may be valuable in early cases. But where the symptoms have been prolonged or the lesion is only questionably reduced, operative therapy is mandatory.

Simple reduction by taxis is the ideal method. If reduction cannot be accomplished by this means or if there is a question of viability, resection should be done. Operations that are designed to prevent recurrence are of little value; the condition recurs in less than 2% of treated cases.

Inguinal Hernia. Most physicians recommend repair in the first year of life, reducing the incidence of strangulation. Herniorrhaphy in a small

child is easily accomplished. Plastic procedures involving the inguinal canal usually are not indicated because fascial defects seldom are present.

CHILDHOOD

Acute Appendicitis. This is the most common abdominal surgical emergency in children. Even the most experienced observers at times find the diagnosis difficult. The triad of abdominal pain, vomiting, and fever in a young child must be regarded as indicative of appendicitis until proved otherwise. Diarrhea is more common in children than in adults.

Acute appendicitis requires appendectomy. If the diagnosis is doubtful, laparotomy should be done.

Meckel's Diverticulum. Acute inflammation presents a picture similar to acute appendicitis; the diagnosis usually is established at the time of operation. Hemorrhage may occur if the mucosa becomes ulcerated; the diverticulum may be the leading point in an intussusception, as well as a focal point for volvulus. Occasionally, adhesions form between a Meckel's diverticulum and adjacent bowel, resulting in intestinal obstruction.

Excision is the preferred treatment for complications of Meckel's diverticulum.

Trauma. Crushing injuries may cause rupture of a hollow viscus. Intra-abdominal hemorrhage can result from lacerations of the liver, spleen, or mesentery. Penetrating abdominal wounds necessitate surgical exploration. Diagnosis is based on a history of trauma, abdominal rigidity, tachycardia, shock, shoulder pain, and roentgenologic evidence of free air in the abdominal cavity. When intra-abdominal bleeding is suspected, peritoneal tap should be done. When intra-abdominal injury is suspected, immediate laparotomy is indicated. (Flotte, C. T., Wolfman, E. F., Jr., *Acute Surgical Abdomen in Childhood: Postgrad. Med.*, 27: 51-56, January 1960)

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Phenylketonuria

In the short space of 25 years since Fölling first identified phenylpyruvic acid in the urine of a mentally retarded patient, knowledge of phenylketonuria has advanced remarkably. It has been possible to develop an effective means of therapy to prevent the mental deterioration which, until recently, has appeared to be inevitably associated with the metabolic defect.

Biochemical Defect. The biochemical nature of the metabolic defect in this condition has been shown to be inability to catalyze the reaction of conversion of phenylalanine to tyrosine.

Genetic Aspects. Phenylketonuria is inherited as a recessive trait with equal frequency in males and females; it appears to be transmitted as a single autosomal gene. Means of detecting the carrier trait are being investigated and avenues of approach pursued.

Mental Deficiency. The major medical problem in phenylketonuria is the severe mental retardation, until recently unavoidably associated with this disease. Most of the affected individuals are idiots and very few have I. Q. 's above 70. The majority must be cared for in institutions. The cause for mental deficiency is unknown, although in several theories it has been proposed that abnormal metabolites might be toxic to nervous tissue.

Low Phenylalanine Diet. Use of a diet low in phenylalanine has resulted in noticeable changes—improvement in neurologic symptoms, better coordination, and decrease in tenseness and irritability. Effects on mental retardation indicate that the earlier treatment is initiated, the greater the effectiveness of the diet. Treatment started after children are two years old appears to have much less effect upon oligophrenia, though some gain in intelligence as well as improvement in motor ability and disposition makes a trial period on the diet worthwhile in older children.

The plasma phenylalanine level has been found to be the best quantitative index of the dietary control achieved. It is possible to reduce the level in phenylketonurics to the normal range, though a value slightly above this seems to be a better goal. By maintaining a higher level, an adequate supply of the essential amino acid, phenylalanine, is assured at all times during the period of rapid growth.

Failure to find phenylpyruvic acid in the urine is not sufficient evidence of optimal dietary control.

Low phenylalanine diets were originally expensive, but are now available commercially (Ketonil: Merck, Sharp, and Dohme; and Lofenalac: Mead-Johnson), although there is a need for improvement in taste and odor to make the diet more acceptable.

The length of time necessary to keep children on the special diet has not been established, although it seems probable that a permanent regimen will not be necessary. It is hoped that by proper control during the first two years the most critical period will be passed. Perhaps after this time the sensitivity of the central nervous system to high levels of phenylalanine may gradually decrease and, within another year or two, the special diet may be safely modified or eliminated.

Diagnosis. Early diagnosis and treatment of this condition are vital to obtain maximum benefit from diet. Greater awareness of the condition and familiarity with presumptive and confirmatory tests is necessary. Finding new cases within a family with known phenylketonuria is a simple problem. But, in the general population, it is estimated that about 1:25,000 new births will have phenylketonuria and that the frequency of the carrier of this disease is 1:70.

Approximately one percent of the population in mental institutions have this condition; therefore, it is a public health problem of considerable importance.

The presumptive tests depend upon the presence of phenylpyruvic acid in the urine. Three to five drops of 10% ferric chloride to 1 ml. of urine results in a green color which gradually fades. The reaction may be observed when ferric chloride is applied to a recently wet diaper. A false positive test may be given by chlorpromazine and aspirin. More important, a single negative test does not exclude phenylketonuria.

All suspected cases of phenylketonuria should be confirmed by measurement of the level of phenylalanine in the blood. The plasma phenylalanine level rises within a few hours after birth and is well above the normal range of values within one day. In contrast, there may be delay of from several days to three weeks or more before phenylpyruvic acid appears in the urine. For this reason, blood determinations in newborn infants in families with known phenylketonuria would permit an earlier diagnosis and avoid unnecessary delay in starting the special diet.

The importance of early diagnosis and treatment cannot be overemphasized, and the simple ferric chloride test of the urine should be a routine procedure in young children. Years ago, ferric chloride was used in every physician's office to detect acetone bodies, but in recent years this test has been replaced by other methods. It is hoped that physicians will put the bottle of ferric chloride back on the reagent shelf for this new purpose. (Editorial: The Importance of Early Diagnosis and Treatment of Phenylketonuria: *Ann. Int. Med.*, 51: 1427-1433, December 1959)

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Pathologic Physiology of Pulmonary Embolism

Constantly accumulating information concerning the physiologic effects of pulmonary arterial obstruction is bringing to the foreground new concepts of pulmonary circulation in health and disease. In recent years there has been particular interest in the reactions to small or miliary emboli of the lungs and the role of vasomotion in circulatory obstruction of the lungs resulting from this accident. These mechanisms—if they exist—are not without importance in clinical medicine.

Pulmonary vasculature is possessed of relatively enormous reserve capacity; experiments show that if elevation of pulmonary arterial pressure occurs from measurable obstruction of the normal lung, occlusion of more than 60 to 70% of the vascular bed must be accomplished. A congested lung proves to be of some exception.

When the right or left main pulmonary artery of an experimental animal is externally occluded, there is little effect upon pulmonary arterial pressure.

However, when one of the pulmonary arterial branches is closed by a large thrombotic embolus, pulmonary hypertension usually ensues, the systemic blood pressure declines, and the right cardiac chambers dilate with accompanying cardiac failure. Mechanical obstruction of localized areas of the pulmonary circulation, in itself, does not account for all of the physiologic responses of pulmonary embolism. There is little agreement as to the fundamental processes concerned. A survey of explanations is reviewed.

1. Reflexogenic Effects of Lung Embolization. At present, there is insufficient evidence to warrant firm conclusions, although most workers believe that neurogenic reflexes play little, if any, role in massive embolism.

2. Liberation of Humoral Substances. There has been increasing evidence that the circulatory and respiratory consequences of pulmonary embolism are dependent—at least in part—upon the release of compounds into the blood that have direct effects upon cardiopulmonary structures. These compounds may be liberated by the occluding thrombus or, feasibly, by the damaged pulmonary tissue.

a. Serotonin (5-hydroxytryptamine): Vascular responses and attendant symptomatology provoked by serotonin are comparable to symptoms resulting from pulmonary vascular obstruction. Pulmonary arterial constriction, systemic hypotension, tachycardia, and tachypnea produced by 5-hydroxytryptamine, and those effects resulting from pulmonary embolism may be more than indifferently related.

b. Histamine: On the basis of present evidence, it appears that histamine is not the provocateur of pulmonary hypertension from embolization, although it may enhance the peripheral vascular collapse that complicates it.

c. Acetylcholine: Acetylcholine may have a definitive part in the physiologic events of pulmonary embolism. Acetylcholine does constrict pulmonary veins, may dilate constricted pulmonary arteries and, in other ways may simulate the effects of pulmonary embolization.

3. Hypoxia. Occurrence of hypoxia in the wake of pulmonary embolization is well known. It does not respond to hyperventilation, but may be abolished by administration of oxygen.

4. Influence of Epinephrine and Norepinephrine. Because of their weakly constrictive properties with reference to pulmonary vessels, these agents are probably of lesser significance in inciting the circulatory responses of lung embolism.

As in the case of massive embolization of the lungs, embolic particles that obstruct secondary and tertiary branches of the vascular tree, if sufficiently numerous, will produce critical mechanical pulmonary arterial occlusion resulting in acute pulmonary hypertension, right ventricular dilatation, and peripheral circulatory collapse. Reflexogenic effects are suggested by some; others have observed medium sized emboli to be

innocuous in terms of producing reflex vascular responses. It appears quite possible for medium-sized emboli to lodge in a lobar artery and, thereafter, because of the turbulence of the blood, to break into fragments at their proximal extremities and thus embolize other lobar branches.

According to some evidence, microembolization of the lungs may result in sudden death. However, this evidence is not complete. Some investigators interpret this reaction as the result of widespread dissemination of the particles producing multiple points of obstruction throughout the vascular tree, thereby accounting for the reaction as being due to mechanical obstruction of the circulation. Conversely, other studies have been interpreted as indicating that miliary embolization invokes reflex constriction of the arterioles of the pulmonary vasculature, producing critical circulatory impedance in that manner.

From information at hand, it is clear that the fundamental circulatory responses occurring in the wake of miliary embolization of the lungs are presently unexplained. Further argument seems futile until more critical data have been secured by additional observation, including experiments with miliary thrombotic emboli. (Nelson, J. R., Smith, J. R., *The Pathologic Physiology of Pulmonary Embolism: Am. Heart J.*, 58: 916-932, December 1959)

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Steroids in Rheumatoid Arthritis

The remarkable suppressive effect of adrenocortical steroids on symptoms of rheumatoid arthritis has led many patients and physicians to rely solely on these preparations. This course, fraught with danger, is in many instances more threatening than the disease itself. While corticosteroids now occupy a definite place in the therapeutic scheme, they do not of themselves constitute adequate treatment for this disease. More may be achieved for most rheumatoid patients if a comprehensive and individualized treatment program is initiated and vigorously maintained. The challenge to the internist in this connection is fourfold: how to insure a good basic program in rheumatoid arthritis; when to use steroids; how to control the dosage to minimize hazards; and, how to manage those patients whose previous steroid dosage has been excessive.

The outline of the basic program which should be employed initially in most patients with rheumatoid arthritis is well presented in "Primer on the Rheumatic Diseases" of the American Rheumatism Association. However, if objective, as well as subjective, improvement is not evident in 6 to 12 weeks, the physician should ask himself three major questions. First, has the patient actually been following conscientiously all details of the treatment? Second, is the diagnosis accurately established? Third, if the answer to the first two is affirmative, what supplemental measures should be considered?

The most commonly used supplemental medications are organic gold salts, adrenocortical steroids, phenylbutazone, and antimalarial drugs. None of these drugs replaces the basic program which must be continued in any event. Each entails not only additional expense, but more important, added hazards to the patient. These hazards must be weighed against the risks of allowing a potentially crippling disease to proceed unabated. The authors believe that all patients with active rheumatoid arthritis deserve an early trial of gold therapy when supplemental medication is indicated.

Numerous factors are to be considered in determining whether to use corticosteroids. Some situations which led the authors to institute this supplemental measure are:

1. The patient with rapidly progressive disease without adequate response to a conscientiously followed basic program.
2. The patient with active disease who is forced, because of financial reasons, to continue activity after considering the calculated risk of suppressing symptoms of arthritis in order to allow overuse of diseased and damaged joints.
3. The patient who needs extra impetus to participate more adequately in the daily basic program based on sound objective, as well as subjective, evaluation. No patient is committed to corticosteroid therapy before relative contraindications are reviewed in each case.

There are three groups of corticosteroids: cortisone and hydrocortisone group; prednisone and prednisolone series; and the newest, dexamethasone. Each has advantages and disadvantages. The clinician will do well to become thoroughly familiar with what can be accomplished with the preparations which have been used the longest. The current practice of skipping about to each new compound as soon as it becomes available without awaiting results of investigation seems imprudent. The situation is further complicated by the multitude of combinations in which the steroids are now appearing. The use of one or another of these "shot-gun" preparations is governed by a thorough realization of the type and amount of steroid in each tablet.

When steroids are employed, the authors prefer to commence therapy with low doses rather than initial large suppressive doses which have to be reduced later to the disappointment of the patient. Hazards of full suppressive doses are explained to the patient and he is encouraged to be grateful for partial amelioration of symptoms. Amounts which in the beginning may be ineffective can be gradually increased to arrive at the smallest dose which gives a reasonable degree of relief in addition to that provided by the continuing basic program.

A patient who is receiving steroids or has had them within 6 months needs the support of increased dosage during periods of added stress. Ideally, each patient taking steroids should carry on his person a card stating the type and dosage of steroid he is using.

Among obvious adverse effects of use of steroids is development of a Cushingoid state. The most insidious adverse effect is the development of

the clinical picture of hypercortisonism characterized by profound cyclic fatigue, psychic mood swings, and myalgia and arthralgia without objective changes. Osteoporosis may lead to vertebral compression with or without significant preceding trauma. A large gastric ulcer may develop asymptotically. Other adverse effects include development of diabetes mellitus, psychiatric disturbances, reactivation of infections, hypertension, and edema.

Perhaps the most difficult challenge to the internist is presented by the patient who, when first seen, is in a state of hypercortisonism induced by previous therapy. Hospitalization is usually indicated and a full-scale basic or conservative program is instituted in addition to slow and careful withdrawal of the steroids. Patience and perseverance are the watchwords. Adequate treatment of hypercortisonism may require 6 months to 2 years and cannot be hurried without undue risk of provoking a severe exacerbation of the underlying rheumatoid process. As Slocumb says, the "treatment of hypercortisonism is more difficult than its prevention."

It is important to remember that when corticosteroids are employed in rheumatoid arthritis little is being done other than suppressing some manifestations of a disease which may be progressing in spite of symptomatic improvement. Steroids cannot prevent all joint damage nor can they be expected to return a damaged joint to normal. They are a part—not the whole—of comprehensive management in rheumatoid arthritis. (Ensign, D. C., Sigler, J. W., Wilson, G. M., Jr., Steroids in Rheumatoid Arthritis: A. M. A. Arch. Int. Med., 104: 949-958, December 1959)

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Chemotherapy of Systemic Fungal Disease

Two mycoses only, actinomycosis and nocardiosis, have responded to routine antibacterial drugs developed since the beginning of the Antibiotic Era 30 years ago. A number of new and promising antifungal drugs have been developed, and one of these, amphotericin, has been given clinical trials in a large number of patients.

Bed rest or other limitation of activity, proper diet—usually high-calorie, high-protein—and supportive medical and nursing care are advisable for all systemic mycoses. Drainage or, when possible, excision of the lesion at the proper time is often beneficial. Chemotherapy supplements these measures.

Actinomycosis. For many years, iodides and roentgen irradiation have been recommended forms of treatment for actinomycosis. Penicillin has been used in an increasing number of cases; more recently, isolated case reports have described cures with chlortetracycline, sulfadiazine, streptomycin, and chloramphenicol. In one series, 36 of the 42 patients with thoracic actinomycosis were successfully treated with large amounts of penicillin for

prolonged periods of time. In the experience of the authors, one patient responded to intravenous administration of 10,000,000 units a day for 8 weeks.

Nocardiosis. The treatment of choice is sulfadiazine in amounts necessary to achieve a serum level of from 9 to 12 mg. %. The authors prefer to supplement treatment with an antibiotic, preferably penicillin.

Aspergillosis. Aspergillus fumigatus and, occasionally, other species are encountered in patients with pulmonary infiltration or pneumonitis and various other sites of infection. Iodides and vaccine therapy have been recommended for such systemic infections. That iodides alone may not always be strikingly effective has been suggested by the author's experience. Dosages up to 24 to 30 gm. a day for several weeks are required, and may result in serious manifestations of iodism. Iodides in smaller doses have been standard treatment in sporotrichosis, geotrichosis, and penicilliosis.

Mucormycosis. There is little experience in therapy of this mycosis because it has been recognized principally at autopsy—in debilitated patients, especially those with diabetes, cancer, and leukemia. Control of the underlying disease is considered to be the most important factor in treatment. Success has been reported from surgical removal of the focus of infection.

Histoplasmosis. (a) Sulfonamides: Reports on the use of sulfonamides in treatment of histoplasmosis have been contradictory. In general, results have been unsatisfactory.

(b) MRD-112: Despite early optimistic reports of the action of this chemical—diethyl aminoethyl fencholate—subsequent studies have been discouraging. The authors have abandoned use of this drug.

(c) Ascospin: An antibiotic produced by Streptomyces canescens, without sufficient clinical evaluation to justify conclusions.

(d) Endomycin: Limited experience has indicated ineffectiveness.

(e) Amphotericin B.: An antibiotic prepared from a species of streptomyces, it has shown limited effectiveness in this mycotic infection. The authors employed intravenous treatment in 7 patients, the maximal therapeutic dosage being 100 mg. daily (2.0 mg. /Kg.), with 4 of the 7 having made apparent recoveries after observation for one-half to two years.

Cryptococcosis. At one time, the most reasonable medical therapy for this mycosis was considered to be cyclohexamide (Acti-dione) or 2-hydroxystilbamidine. However, only 6 patients were reported to have benefited. Recently, two drugs have shown promise:

(a) Silver: Several silver salts have been shown to prolong survival times of mice with experimental cryptococcosis. Clinical use has been reported in only one patient, with no apparent improvement.

(b) Amphotericin: In the authors' experience, 2 of 8 patients have shown recovery. When intrathecal and intravenous therapies were combined, three additional patients improved. Other investigators report similar benefits.

Blastomycosis. (a) 2-Hydroxystilbamidine: Treatment with this drug has been termed "reasonably satisfactory."

(b) Amphotericin: Three of 5 patients treated by the authors recovered; all 5 patients treated by two separate investigators improved.

Coccidioidomycosis. Chemotherapy of disseminated coccidioidomycosis in man was termed "universally disappointing" in 1955—since then, experience has not suggested a change of opinion. Some success from use of amphotericin has been reported.

Candidiasis. (a) Mycostatin: An antibiotic derived from Streptomyces noursei, it is effective orally for oral or enteric candidiasis, or when applied locally to skin infections due to candida. It is not absorbed from the gastrointestinal tract and is ineffective in systemic fungal infections. Toxicity prohibits intravenous use.

(b) Amphotericin: The authors report apparent recovery in only one of 5 patients treated with amphotericin.

Toxic reactions to amphotericin have commonly been fever, chills, nausea, and rise in blood urea nitrogen. In 22 of 30 cases with blood urea nitrogen rise, dosage was reduced or therapy interrupted for a few days, but in no instance did treatment have to be stopped. In all instances, toxic effects were reversible at the end of therapy. (Utz, J. P., Treger, A., The Current Status of Chemotherapy of Systemic Fungal Disease: Ann. Int. Med., 51: 1220-1229, December 1959)

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Oral Antidiabetic Therapy

Some evidence exists suggesting that the majority of patients with diabetes have subnormal concentrations of insulin in the plasma, but a hypernormal quantity of insulin has been demonstrated in certain instances. Complications of diabetes may result from abnormalities in lipid and protein metabolism which occur during the several hours of numerous days when insufficient insulin is available. Vigorous search for orally effective compounds has been made in an effort to attain smoother control of this disease.

Sulfonylureas. These substances are tolbutamide, chlorpropamide, and metahexamide. Tolbutamide has been the subject of much more extensive observation and evaluation than either of the other two.

Mechanism of action: Universal consensus relative to mechanism of action is lacking. Tolbutamide's major action presumably is to increase insulin release from pancreatic beta cells, but this drug also decreases hepatic glucogenesis, particularly when insulin is present. The increased release of insulin is apparently of slight magnitude, but extends over many hours. Ordinarily, the direct hepatic effect of tolbutamide seems to be too weak to produce hypoglycemia without the permissive role of insulin.

Effect on Diabetes: Early investigations with tolbutamide have demonstrated that a good response was favored by (a) old age, (b) recent

onset of diabetes, (c) small insulin requirements, and (d) other features influencing the type and severity of diabetes. It seems likely that the influence of these factors depends chiefly upon the extent to which they influence insulin secretion and effectiveness.

Survey of several extensive series of cases treated by tolbutamide has revealed that approximately two-thirds of diabetics received a daily maintenance dose of 0.5 to 1.5 gm.; 90% received 2 gm. or less. Rarely, is a dose in excess of 1.5 gm. advantageous; the minimal effective dosage should be sought in all instances. Because of the short half-life of the compound, it is desirable to administer it twice daily—before breakfast and supper.

Approximately 2 to 5% of patients, who show a satisfactory response to tolbutamide for intervals of months, subsequently develop a refractoriness to this drug and are said to have "secondary failure." Such a failure is apparently related to the increased capacity of the body to inactivate the compound rather than to refractoriness to it by the beta cells because the latter often respond to another sulfonylurea and, after omission of tolbutamide for several months, will again respond to it.

There is no evidence of exhaustion of beta cells by prolonged tolbutamide treatment. An opposite effect is suggested—antidiabetic action.

Side Effects: Side effects have been relatively mild, consisting of headache, malaise, anorexia, epigastric discomfort, diarrhea, skin rashes, leukopenia, and hypoglycemia. There are no reports of definite damage to liver or kidneys.

Comparative Effects: Metahexamide is absorbed most rapidly from the gastrointestinal tract; next is chlorpropamide. With equal doses, chlorpropamide accumulates to the greatest extent in the body; next is meta-hexamide. Various investigators have found that the blood sugar lowering action of chlorpropamide is between 2 and 10 times greater than that of tolbutamide, and that of metahexamide between 5 and 40 times greater than that of tolbutamide.

The mechanism of action of chlorpropamide and metahexamide has been found presumably to be similar to that of tolbutamide. However, they have been somewhat more effective than tolbutamide in controlling diabetes. Side effects of chlorpropamide have been reported to occur in approximately 8% of patients—anorexia and nausea most frequently. In one report, jaundice was observed in 0.4%; two patients died, but other contributory factors may have existed. Additional serious side effects have been reported consistently. Similarly, serious side effects have been noted from use of metahexamide, jaundice being the most disturbing reaction.

Advantages of the other two substances of this group do not appear to overbalance disadvantages when compared to tolbutamide. Nevertheless, chlorpropamide has advantages in treating certain patients in whom tolbutamide has failed. Metahexamide has caused jaundice with sufficient frequency

to prohibit further use in the United States. Occasionally, all three compounds have been found to produce hypoglycemia; tolbutamide is the less frequent offender.

The sulfonylureas are rarely useful in treatment of juvenile diabetes, except in some patients when one is combined with insulin to provide smoother regulation. Furthermore, their usefulness is limited during acute stress.

Phenethylbiguanide. Guanidine and many of its derivatives have long been known to produce hypoglycemia, but interest presently has been centered on a condensed diguanidine—phenethylbiguanide (PEBG).

Mechanism of Action: Information relative to its primary action is incomplete. It inhibits oxidative phosphorylation and may cause anoxia; conversely, anoxia inhibits oxidative phosphorylation. Anoxia may lead to hypoglycemia through two mechanisms: (a) increase in glucose uptake by peripheral tissues (Pasteur effect), and (b) decrease in hepatic glucogenesis. With anoxia, there is an increase in anaerobic glycolysis and lactic acid, and a decrease in glycogen. Anoxia also inhibits gluconeogenesis and leads to a decrease in liver glycogen and hepatic glucogenesis. PEBG, by inhibiting oxidative phosphorylation, decreasing high energy phosphate, and decreasing Krebs' cycle activity, could account for the lack of energy observed in some patients treated for months with this compound.

Clinical Studies: The authors found that PEBG causes a decrease in blood sugar by 30% or more in one-half of the subjects, with a 50% decrease in glycosuria or a decrease in insulin requirements of 30% or more.

Extensive use of the drug is hampered by two types of side effects: (a) early—usually within the first few days—consisting of anorexia, nausea, and vomiting, or (b) late, consisting of lassitude, weakness, and slight weight loss observed one or more months after beginning therapy. The authors observed early effects in about one-half of the patients, and late effects in about one-third of those treated for from one to two months or longer. No permanent ill effects have been reported.

In the authors' experience, the chief need for PEBG is as an adjunct to insulin in juvenile diabetics. Also, used simultaneously with sulfonylureas, it is more effective than either drug alone. In some patients with maturity-onset diabetes, PEBG is more effective than insulin or sulfonylureas, but the latter are preferable oral agents in the majority of such patients.

Oral therapy for diabetes is a worthy objective, provided it appropriately controls the metabolic alterations of diabetes. The advantages must outweigh the disadvantages. All oral agents must be evaluated objectively, noting their effects not only on the levels of glucose in the blood and urine, but also upon many phases of the metabolism of carbohydrates, fats, and proteins as well as their effect on general health with prolonged usage. (Williams, R. H., et al., Oral Antidiabetic Therapy: *Ann. Int. Med.*, 51: 1121-1133, December 1959)

Radiation Nephritis

Due to the more frequent use of megavoltage radiation therapy equipment, malignant tumors and adjoining normal structures deep within the body are being treated to much higher doses than were previously possible with orthovoltage equipment. As an undesired coincidence, deleterious effects on structures adjacent to those being irradiated may be expected. A historical review of observations of many experimenters since 1904 is presented, indicating a long-standing recognition of renal damage of varying degrees resulting from exposure of the kidneys to radiation.

Of the 63 cases of radiation nephritis reported in the literature to date, the majority fall into four groups: (1) acute radiation nephritis, (2) chronic radiation nephritis, (3) benign hypertension, and (4) late malignant hypertension.

From animal studies and clinical observations of patients, sensitivity of the kidneys to irradiation is well demonstrated. Variations in functional alterations and multiple clinicopathologic entities which may occur mirror the wide range of photosensitivity of individual renal tissue. It is difficult to determine how much damage to the nephron is due to direct injury by irradiation and how much is secondary to vascular damage or to widespread interstitial fibrosis. To what extent an individual tubule may be damaged and still recover is not yet clear. The degree of the recovery of the kidney from a pathologic process is determined to a large extent by the presence of the other kidney, or otherwise, the vital necessity for that recovery to take place.

Following irradiation of the kidney, hyperemia and increased capillary permeability result in interstitial edema which separates tubules and capillaries by a protein exudate. The protein exudate then becomes the site of collagen precipitation. Capillaries become thrombosed, arterioles and large local arteries and veins slowly thicken. Necrosis may follow, essentially due to an anemic infarction.

At present, it is not known how renal irradiation produces hypertension or what factors determine the development of radiation sclerosis. Renal anoxia is believed to result in production of a substance in the kidney tissue—renin—which reacts with a pseudoglobulin of the plasma, producing a pressure substance known as angiotonin or hypertensin. The occurrence of hypertension with advanced nephrosclerosis may readily be explained on this basis of renal anoxia. The occurrence of hypertension with minimal or no histologic abnormalities may be due to functional alteration within the tissues which do not produce identifiable cytologic changes.

Findings of renal sensitivity and more frequent use of megavoltage irradiation make it imperative that renal function and localization be determined before irradiation of the upper abdomen. The field arrangement should be so located as to preserve as much kidney tissue as possible. It is quite

probable that many cases of radiation nephritis develop and are unrecognized because of the long latent period of 6 to 12 months before clinical symptoms become apparent. Also, because the underlying pathology for which intensive irradiation is utilized is often so serious as to shorten life expectancy, subsequent symptoms are usually attributed to the basic disease. To revoice Luxton's comment, "Radiation nephritis is a process which is largely avoidable." (Redd, B. L., Jr., Radiation Nephritis: Am. J. Roentgenol., 83: 88-106, January 1960)

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Doctor Hoogstraal Receives Award

The Secretary of the Navy Distinguished Civilian Service Award has been presented to Harry Hoogstraal, Ph. D., Biologist at the Naval Medical Research Unit No. 3, Cairo, Egypt, for his contribution to naval medical research in the field of epidemiology. Dr. Hoogstraal has been assigned in NAMRU No. 3 for the past ten years.

The Honorable James H. Wakelin, Jr., Assistant Secretary of the Navy for Research and Development, representing the Secretary of the Navy, made the presentation of the award.

With the award, Dr. Hoogstraal received the following citation:

"For exceptional and exemplary contributions which have added significantly to naval medical research in the field of epidemiology. Your distinguished Federal Civil Service from 1949 to 1959 as Head, Medical Zoological Department, United States Naval Medical Research Unit No. 3, Cairo, Egypt, United Arab Republic, has brought you recognition as a world authority on ticks and tick-borne diseases and mammalogy. Your extensive catalogued collections, your researches and numerous publications on the subject have made major contributions to the taxonomic classification, geographic distribution, diseases and ectoparasites of man and animals. The integrity of your scientific work has brought the world-wide respect of your colleagues. Your many travels and your personal attitude toward all with whom you have been associated have contributed significantly to the person-to-person relationships of the United States to many other peoples throughout the world."

Dr. Harry Hoogstraal, born in Chicago, Ill., graduated from Fenger High School in that city. He spent the next eight years studying at the University of Illinois, and received the Degree of Master of Science in 1942. The subsequent four years were spent on active duty in the Army. During this period, he was assigned to the 19th Medical General Laboratory as Assistant

Entomologist, and later served as Head of the Department of Entomology in New Guinea and the Philippines with assigned duties in Malariology, and research in mosquito taxonomy, biology, and control.

Following release from active duty, Dr. Hoogstraal headed the Philippine Zoological Expedition in remote areas in the Philippines for the Chicago Natural History Museum and the Philippine Government. This expedition was followed by work as medical zoologist on the joint U. S. Navy-University of California African Expedition for which he received the Distinguished Public Service Award and the Secretary of the Navy Citation. During the latter expedition, he was in charge of two research teams which studied the blood parasites of animals in the Anglo-Egyptian Sudan and Madagascar, discovering a number of new species of great importance for laboratory study.

During his years at NAMRU No. 3, through inspired and tireless effort, Dr. Hoogstraal developed an almost worldwide program of exchanges of specimens and information by personal contacts and correspondence. He assembled one of the world's most complete collections of ticks, each of which has been painstakingly identified by methods developed by himself and his colleagues he has trained. His personal bibliography consists of nearly one hundred reports and papers, principally dealing with ticks and related problems. In addition, he has assembled one of the world's most complete libraries of reference materials on ticks and tick-borne diseases. These collections have made basic contributions to knowledge of the geographic distribution and nature of tick-borne diseases throughout the world, and more particularly in Africa where the problems are of major magnitude. The stature of his contributions has been recognized by such international agencies as the World Health Organization, the Food and Agricultural Organization, and by universities and scientific institutions throughout the world who seek his advice and collaboration.

Through his unfailing good humor, patience, and interest during the ten years of his stay in Egypt, Dr. Hoogstraal has gained a wide circle of friends throughout all levels of Egyptian society. Respected by scientists and laymen alike, he has done much to maintain the regard with which they hold Americans.

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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Navy's Military Assistance Training Program

For the past ten years the U. S. Navy has been furthering the cause of freedom through its military Assistance Training Program. This program is carried out for the mutual benefit of the navies of designated friendly and Allied nations and the U. S. Navy. These mutual benefits are realized by providing appropriate types of training in the fields of naval technology for foreign personnel at U. S. Naval training facilities both overseas and within the continental limits of the United States, ashore and afloat.

Major objectives of the Military Assistance Training Program are to:

Insure proper maintenance, use, and operation of Military Assistance Program provided equipment.

Attain allied combat effectiveness at the earliest possible time.

Increase the skill of allied and friendly personnel.

Create friendship and goodwill for the United States by utilizing the Military Assistance Program to further the President's "People-to-People Program."

The Military Assistance Training Program is administered by the Chief of Naval Operations with the assistance of cognizant bureaus, offices, and agencies of the Navy Department. Trainees in this program are nominated by their own government or military service, and come to the U. S. Naval training facilities as invited guests on invitational travel orders. The high standards which are required by the trainee's country and by the U. S. Navy tend to assure successful completion of the training period. As a rule, prospective students must fulfill the same academic prerequisites and meet the same physical standards as required of the U. S. Naval personnel performing the same duties or receiving the same training.

In accordance with the policy of the Military Assistance Training Program, and under the direction of the Chief of Naval Operations, the Chief of the Bureau of Medicine and Surgery provides training for naval medical department personnel of friendly foreign nations. Members of the Medical, Dental, Medical Service, Nurse, and Hospital Corps of these nations may obtain training through this program in most of the professional, technical and military aspects of their duties. Some of the training is given by formal courses of instruction and the remainder by on-the-job and observership training.

Activities providing this training are the U. S. Naval Medical School, Dental School, School of Hospital Administration, and the School of Aviation Medicine; various naval hospitals; hospital corps schools, dental technician's schools, field medical service schools, submarine and diving schools; and other activities.

Personal contacts with highly selected individuals from other countries result in the exchange of knowledge and technical ability of benefit to

U. S. Naval personnel. This association also provides an opportunity for trainees who are our guests to see our way of life and to gain information about our objectives. It is on the basis of mutual respect and understanding that goodwill and lasting friendships are built among nations.

The Bureau of Medicine and Surgery's portion of the Military Assistance Training Program has grown steadily since its beginning as has the total Navy program; the number of students has increased each year. Likewise, there has been a steady increase in the number of courses and programs sponsored by the Medical Department. Additional growth is expected in the coming years and further expansion of training activities is anticipated. Therefore, the Bureau of Medicine and Surgery is proud of its part in the Military Assistance Training Program, and has reason to believe that it is making a positive contribution through this program to the collective self-defense of the free world. (TIO, BuMed)

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Directory of Blood Transfusion Services

Informational material and specific data for 1959 are now being gathered from all hospitals and blood banks in the United States and territories by the Joint Blood Council. The information will be published in a new directory of Blood Transfusion Facilities and Services which will be issued by early spring.

The first directory produced by the Council covered the year 1956, and included 2202 facilities which collect, process, distribute, or use whole blood.

Technical and operating procedures of blood banks and hospital transfusion services as well as sources and usage of blood are to be recorded. Also included will be approvals, supervision, reciprocity exchange systems, and other services, such as tissue storage banks. This information has been found to be useful to hospitals, blood banks, medical libraries, and to Federal medical agencies.

The Joint Blood Council is a nonprofit organization formed and supported by the American Association of Blood Banks, American Hospital Association, American Medical Association, American Red Cross, and the American Society of Clinical Pathologists. Its primary purpose is to "establish a national blood program in order to assure an adequate supply of blood and blood derivatives to the civilian and military population at all times of peace or emergency . . ." The Council's directory service furnishes a basis for such a program by locating transfusion services and blood banks and recording their capabilities and dependencies.

The forthcoming directory will list hospitals using blood as well as hospital blood banks, Red Cross centers, and community blood banks which collect, process, and distribute it. (Joint Blood Council, Inc., 1832 M Street, N. W., Washington 6, D. C.)

Recent Research ReportsU. S. Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Effects of TOCP Exposure on the Acquisition, Extinction, and Generalization of Conditioned Responses. Memorandum Report 59-4. NM 18 01 00.02, 18 August 1959.
2. A self-Cleansing Tube to Aid in Colostomy Irrigations. Memorandum Report 59-5. NM 000 018.07, 28 August 1959.
3. Role of Soft Tissues in Osteogenesis - An Experimental Study of Canine Spine Fusions. NM 71 01 00.06.04, 31 August 1959.
4. Effects of Prolonged Inhalation of Hypernormal Amounts of Carbon Dioxide. I. Physiological Effects of 3% CO₂ for 93 Days upon Monkeys. NM 24 01 00.01.01, 31 August 1959.
5. The Reproductive Cycle and Litter Size of the Southern Woodchuck. NM 24 01 00.04.08, 3 September 1959.
6. Effect of Constant Length of Day on Reproduction in Albino Mice. NM 24 01 00.04.07, 3 September 1959.
7. Growth of the Rat Trypanosome During 300 Serial Passages in Calorically Restricted Mice. NM 52 02 00.01.05, 11 September 1959.
8. Growth of the Rat Trypanosome During 220 Serial Passages in Adequately Fed Mice. NM 52 02 00.01.06, 11 September 1959.
9. The Heterologous Host as a Research Tool in Nutrition Studies on Parasitic Protozoa. Lecture and Review Series No. 59-4, 11 September 1959.
10. Penetration of Host Skin by Cercariae of Schistosoma Mansoni. II. Chronological Analysis, Pattern, and Rate of Migration in Body, Ear, and Tail Skin of Mice. NM 52 02 00.01.08, 18 September 1959.
11. Studies on Mineral Metabolism in the Albino Rat. III. Excretion of Calcium Phosphate, and Citric Acid by NMRI-D Rats Fed Diets Conducive to, or Preventing, Calcium Citrate Urolithiasis. NM 75 01 00.01.06, 21 September 1959.
12. Comparative Ganglionic Blocking Potencies of the Geometric Isomers of Two Cyclic 1,2-Aminoalcohols. NM 72 02 00.02.06, 21 September 1959.
13. Observations on Phospholipid and Triglyceride Metabolism of Excised Rat Diaphragm and the Role of These Lipids in Fatty Acid Uptake and Oxidation. NM 72 02 00.02.07, 2 October 1959.
14. The Validity of Using Carboxyl Labelled Fatty Acids in the Quantitative Study of Terminal Respiration of Rat Diaphragm. NM 72 02 00.02.08, 2 October 1959.

U. S. Naval Medical Research Unit No. 3, (Cairo, Egypt), Navy #540, c/o Fleet Post Office, New York, New York

1. Clinical, Histopathological, and Bacteriological Study of the Liver in Chronic Fibrocaceous Pulmonary Tuberculosis. NM 72 01 03.12.02, January 1959.

U. S. Naval Medical Research Unit No. 3 (continued)

2. Bibliography of Sensory Deprivation, Isolation, and Confinement. MR005. 14-2100. 03. 04, January 1960
3. An Exploratory Study of the Relationship of Autonomic Resiliency to Manifest Anxiety and Selected Personality Traits. Report No. 307. NM 23 02 20. 01. 05, March 1959.
4. Studies in Immunity to Schistosoma Haematobium. I. Cross Reactions with Cercarial Antigen of Schistosoma Mansoni. Noted by a Slide Flocculation Technique. NM 52 02 03. 8. 01, April 1959.
5. Evaluation of Furoxone in the Treatment of Shigellosis. NM 72 01 03. 13. 01, April 1959.
6. Hemagglutination Studies with Schistosoma Haematobium. NM 52 02 03. 8. 02, May 1959.
7. A Preliminary Observation of Electrophoretic Distribution of Blood Proteins in Permanent and Transient Residents of Egypt. I. Differences in Venous and Capillary Samples. NM 75 02 03. 2. 02, July 1959.
8. The Loudness Difference Limen for Tones in Noise. Report No. 314. NM22 01 20. 02. 01. August 1959.
9. Approaches to the Study of Motivation of Officer Candidates for the Submarine Service. Report No. 321. MR005. 14-1200. 02. 02, 16 October 1959.

Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Pa.

1. NADC Biological Instrumentation Symposium on 10 December 1958; fourth letter report concerning. MR005. 15-0002. 2, 28 December 1959.
2. Preliminary Study of Damping of the Otolith Organ System by Epicyclic Rotation. MR005. 13-6002. 1, 28 December 1959.
3. Biosatellite, Development and Study with; letter report concerning life support system. MR005. 15-0002. 16, 6 January 1960.

(To be continued at an early date)

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BUMED INSTRUCTION 6240. 3A

24 December 1959

Subj: Standards for Potable Water

The purpose of this instruction is to establish standards for water for drinking and culinary purposes throughout the Naval Establishment. Bacteriologic quality and physical and chemical characteristics shall be those standards shown in "Public Health Service Drinking Water Standards, 1946." These standards may be found in NavMed P-5010-5, Water Supply Ashore, which is available through the Navy Supply System.

From the Note Book

Officers' Moral Responsibility. Evaluation of an officer's sense of moral responsibility has been made an integral part of the fitness report in a directive issued by the Chief of Naval Personnel. Although leadership has been a rating factor in reports since 1918, the new inclusion further emphasizes the concept of Naval leadership expressed in General Order 21. (ONI)

"Sailor of the Month." The Surgeon General of the Navy has announced that a "Sailor of the Month" Program was recently established at the U.S. Naval Hospital, Philadelphia, to allow deserving enlisted personnel to receive official recognition for outstanding attributes and performance of work assignments. The award will be based on: professional performance; military behavior; leadership and supervisory abilities; military bearing; ingenuity; and moral character. (TIO, BuMed)

Foreign Students at EST School. Thirty students comprising Class No. 31 of the Environmental Sanitation School, U.S. Naval Hospital, Oakland, Calif., began the 5-month course of instruction on 4 January 1960. Five of the group are foreign students—two officers and two enlisted men from the Korean Navy, and one enlisted man from the Chinese Marine Corps. (The Sanitation Technician, 18 January 1960)

CPC Loan Sets. The Armed Forces Institute of Pathology announces that more Clinical Pathological Conference loan sets have been completed, bringing the total in the new series to 43 now available for loan. (AFIP Letter, 1 February 1960)

New Antibiotic. A new drug—cephalosporin C—which appears to wipe out many infections resisting penicillin, has been discovered. The drug, first discovered in sewage effluent in Sardinia, is closely related to the penicillin family, but has a different chemical structure, and is being produced synthetically in England. Tests on animals have proved completely successful and similar tests on human beings are to be initiated. (Science News Letter, 9 January 1960)

Primary Syphilis in 81-Year Old. "The resurgence of primary and secondary syphilis . . . has rekindled many a physician's interest in this fascinating disease whose infinite variety age cannot wither nor custom stale. . . . It is not our intention to initiate an international contest among physicians over who has had the oldest patient with primary syphilis (the authors report incidence in an 81-year old man), but we want to emphasize . . . that any genital lesion should be suspected of being syphilis until proved otherwise and

that syphilis is no respecter of age." (N. Fiumara, New England J. Med., 7 January 1960)

Routine STS on Hospital Admission. Of 13,372 routine tests for syphilis in a large general hospital, 141 tests (1.06%) were positive, and led to diagnosis and treatment of 5, or possibly, 6 persons. Although the number discovered was small, the clinical importance of the discovery cannot be overlooked. The author considers that continuation of routine testing on all hospital admissions—except children and those over 60 years of age—may well be worthwhile. (R. Bell, Am. J. Clin. Path., December 1959)

Water Intoxication Following Enemas. Both clinician and radiologist should be aware of potential hazards of water intoxication from tap water enemas where megacolon or chronic constipation exists. In such patients, enemas should be limited to isotonic solutions or bland oils. (J. Gillespie, et al., Am. J. Roentgenol., December 1959)

Liver Effects of Iproniazid. In the December 1959 issue of the American Journal of Digestive Diseases, Bralow and Shay report histories of two patients who made an uneventful clinical recovery from severe hepatic damage which developed while receiving iproniazid. No specific pattern of liver dysfunction could be found to aid in differentiation from viral hepatitis. They urge that dangers of iproniazid should be kept in mind and its use limited to cases where the risk is warranted. Zetzel, et al., in the following article report that elevations in SGPT may occur in patients receiving iproniazid, but that they do not foreshadow inevitable development of liver disease in spite of continued administration of the drug.

Intrathecal Phenol. A method of destroying the anterior spinal roots painlessly is described. Two articles report this method to render flaccid the spastic lower limbs of subjects suffering severe pain associated with extreme spasticity and spasms. (P. Nathan; and R. Kelly, P. Gautier-Smith, The Lancet, 19 December 1959)

Mechanism of Ulcer Pain. Observations of the authors do not support the concept that ulcer pain is produced by direct chemical irritation by hydrochloric acid. Mucosal engorgement accompanying the ulcer may lower the threshold to hydrochloric acid, permitting the acid and perhaps other stimuli to initiate the reflex disturbance in the motor activity of the stomach and duodenum which appears to be the direct cause of ulcer pain. (E. Texter, Jr., et al., Ann. Int. Med., December 1959)

Cholecystography in Jaundice. Considering that cholecystography in the presence of jaundice is a feasible and helpful procedure in diagnosis of biliary tract

disease, the authors diagnosed significant gallbladder pathology in 2 of 4 cases studied when infectious hepatitis was suspected clinically. (P. Meyers LT MC USNR, R. Barr LT MC USNR, Am. J. Roentgenol., December 1959)

Postoperative Ileus. Based on use in 400 patients who received more than 7,800 injections, it was the impression of the authors that prophylactic treatment with ambenonium chloride seems to be more effective than the same treatment with neostigmine in prevention of postoperative ileus. Dosage used in the majority of cases was 1 ml. of 1:16,000 solution every 4 hours. A lower incidence of secondary reactions was noted. (C. Bilbao, et al., Surgery, December 1959)

Treatment of Hypercholesteremia. In 10 patients with hypercholesteremia who were not restricted in amount or type of dietary fat, treatment with large oral doses of nicotinic acid (niacin) was more effective in lowering plasma cholesterol than was that with either safflower oil or sitosterol. However, the safety of such long-term use of niacin must be established. (K. Berge, et al., Am. Heart J., December 1959)

Urea as Ocular Hypotensive Agent. Intravenous urea has proved to be remarkable for reduction of intraocular pressure. The authors demonstrated that urea is also effective orally, with a maximum effect usually two and one-half to three hours after ingestion, and return to pretreatment level in about seven hours. Palatability of preparations is the present limiting factor. (M. Galin, et al., A.M.A. Arch. Ophth., December 1959)

Defibrination Syndrome. In the December issue of Blood, The Journal of Hematology, a panel discussion is presented, edited by Tocantins, of the management of the obstetrical patient with hemorrhage due to an acute or subacute defibrination syndrome. Specific methods of diagnosis and treatment are presented.

Surgery of Cancer of the Colon. A survey of surgeons representing a cross section of the country was made by the author. Results showed divergent opinions regarding the treatment of choice in a case in which exploration was negative after a patient had sloughed polyps of grade I adenocarcinoma. Sixty percent of the surgeons were against blind resection for possible residual cancer. (R.M. Murgage CAPT MC USN, Postgrad. Med., December 1959)

Therapy of Peptic Ulcer. A series of articles by various authors covering specific phases of therapeutic principles in management of peptic ulcer is presented—diet and antacids, anticholinergic agents, anticholinergic-tranquilizer combination, and radiation therapy with cobalt-60. (Am. J. Digest. Dis., December 1959)

DENTAL**SECTION****The Primary Caries Lesion**

Several hundred teeth were serially sectioned and studied by means of polarized and fluorescence microscopy and microradiography. In many instances, areas of enhanced fluorescence and altered birefringence were found in the enamel, although it was not possible to detect any loss of mineral content by microradiography or with a clinical explorer. These areas might have been the primary or preclinical lesions of early caries. Results of the study suggest that this primary lesion was due to some organic agent initiating from the accumulation of oral material on the enamel surface which diffused into the enamel and produced the effects described. The form of the carious lesion was shown to be influenced by microscopic structural features of the enamel and to have existed in geometrical forms quite different from the "classical" truncated cone. The hypermineralization of the surface of the carious lesion was also substantiated. (Forziati, A. F., Jennings, W. H., Losee, F. L., J. Dent. Res., July - August 1959)

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Chain of Command Within the Dental Department

The Dental officer should utilize the chain of command to correct actions of his men. He should explain to his officers and leading petty officers what must be corrected, making clear to them that they will be held responsible for any improper action of their subordinates. If the chain of command within the Dental Department is properly organized, this procedure results in high standards and good morale. The Dental officer should make all of his subordinates feel responsible for building and maintaining a high state of discipline by emphasizing the use of positive measures to reduce the number of disciplinary actions.

Knowing what constitutes an offense is a basic requirement for the disciplinarian, but one that is all too often unfulfilled. Naval officers must familiarize themselves with the Navy system of courts and boards, and with

articles contained in the Uniform Code of Military Justice. They should know the offenses that are punishable, as well as the authorized punishments for those offenses and Navy policy concerning offenses involving moral turpitude.

A breach of discipline cannot be ignored one day and rebuked the next, for under such a regime men don't know where they stand. Disciplinary deterioration follows when rules are not enforced. If men are allowed to defy one regulation openly and with impunity, an indifferent attitude toward other regulations results. A regulation that has outlived its usefulness should be cancelled immediately; otherwise it becomes a regulation that is ignored.

Discipline can be strict without being stiff and formal. For a first and minor offense, a commanding officer will usually adjudge a light punishment that is prompt and just. This may be more effective than a stiff court sentence. Immediate action leaves no doubt in the mind of the offender as to why he is being punished. Nothing is gained by delay, in fact, delays cause resentment toward the entire system, especially when a man is eventually acquitted.

Insubordination or laxity of performance cannot be tolerated. Any hint of serious trouble must be dealt with promptly, but if reprimands are necessary they should be given in private. It is equally important, however, that public commendation be made when recognition of outstanding work is merited.

Usually, it is best to avoid contact with a drunken man; certainly, it is best to avoid arguments with him. The master at arms should take him into custody until he is sober.

Indiscriminately bringing men to mast for trivial offenses is unwise. But the Dental officer who does not report an offender is a menace to discipline and a nuisance to his fellow officers. Eventually, he will lose the respect of his men.

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Inter-Medical-Military TV Network

What is believed to be the first inter-medical-military television network system was inaugurated when the U. S. Navy Dental School, National Naval Medical Center, Bethesda, Md., presented an hour and a half presentation on 10 December 1959. A course in casualty care was presented by CAPT H. J. Towle, Jr. DC USN to the inservice training program of the Medical Center Nurses and personnel of the Dental School. The presentation originated in the television studios of the Center and was transmitted over the inter-medical-military network to the Walter Reed Army Medical Center, Washington, D. C.; U. S. Army Hospital, Fort George G. Meade, Md.; and the Air Force Hospital, Andrews Air Force Base, Md.

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Utilization of Ultra-Speed Film

Difficulty has been experienced at many naval dental activities in using ultra-speed x-ray film with the mechanical spring type timers. Since the speed of this film is eight times faster than intermediate speed film, the resulting time of exposure is in most cases less than one second. No degree of accuracy can be obtained with these timers at such fast speeds. In order to obtain optimum results, it is suggested that one of the following changes be made in equipment or technique:

1. Replace the spring type timer with an electronic timer which must be procured from non-naval sources, and which must be funded locally because no Bureau funds are available. The electronic timer is extremely accurate in all exposures including those of fractions of seconds.

2. Increase the focal-film distance from the usual 8 inches to 16 inches. By doubling this distance, four times the exposure time will be required (inverse square law). Substitution with the eight times faster ultra-speed film permits reduction of the original exposure to one-half; this will be over one second which can be accommodated by the mechanical timer. (See example)

FILM TYPE	FOCAL-FILM DISTANCE	AVERAGE MILLIAMPERE-SEC: PER EXPOSURE	
Intermediate	8"	25 MAS	2½ sec. @ 10 MA
	16"	100 MAS*	10 sec. @ 10 MA
Ultra Speed (1/8th of intermed. film exp. time required)	16"	12½ MAS (1/8th of 100 MAS)	1¼ sec. @ 10 MA

* Inverse Square Law: If the focal-film distance is doubled, four times the original exposure is required.

3. Decrease milliamperage output of the x-ray machine from 10 MA to 2½ MA on machines (such as the General Electric Model E) which have no MA dial adjustment of the points on the stabilizer by a dental repairman. This decrease will require a fourfold increase in seconds of exposure, but (as in #2 above) with ultra-speed film, only one-half the exposure used with intermediate film will be required. Again, this should be well over one second and within the capabilities of the mechanical timer. (See example)

Intermediate	8"	25 MAS	2½ sec. @ 10 MA
Ultra Speed	8"	3 1/8 MAS (1/8th of 25 MAS)	1¼ sec. @ 2½ MA

Professional Notes

CAPT Kraske Presents Essay. CAPT L. M. Kraske DC USN, Administrative Command, Naval Training Center, Great Lakes, Ill., recently presented a scientific essay at the Crerar Library before the Chicago Section of the International Association for Dental Research. The essay, "Evaluation of Panoramic X-Ray Procedures," was presented before approximately fifty members and guests.

CAPT Ludwick Presents Paper. CAPT W. E. Ludwick DC USN, Senior Dental Officer, U. S. Naval Support Activity, London, England, presented a paper, "Some Aspects of Dental Research in the U. S. Navy," before Dental officers of the Royal Netherlands Armed Forces on 9 December 1959, at Den Helder, Netherlands. Following the presentation, CAPT Ludwick visited dental clinics afloat and ashore.

CAPT Wolcott Presents Papers. CAPT R. B. Wolcott DC USN, Director, Dental Research Facilities Division, U. S. Naval Training Center, Great Lakes, Ill., recently presented two papers at the Conrad Hilton Hotel in Chicago. The first, "Amalgam, What Now?" was sponsored by the American Academy of Restorative Dentistry. The second, "Dental Research at Great Lakes," sponsored by the Chicago Dental Society, was presented at the Annual Mid-Winter meeting. CAPT Wolcott also acted as Program Chairman for an all-day program at the School of Dentistry, Marquette University, Milwaukee, Wis., sponsored by the American Academy of Gold Foil Operators.

DR. Howard L. Ward Presents Lecture. At the request of Base Dental Officer, CAPT C. F. Hoyt DC USN, Dr. Howard L. Ward of New York City, presented an illustrated lecture at the U. S. N. H., Key West, Fla., for the benefit of area civilian dentists and Naval Dental officers. Dr. Ward is civilian consultant to the U. S. N. H., St. Albans, N. Y., Associate Professor of Periodontia and Oral Medicine, New York University Dental School, and a Diplomate of the American Board of Periodontology. His subject, "Surgical Treatment of Periodontal Conditions," was expertly presented and of great educational value to those attending. Dr. Ward went to Key West in the interest of furthering dental education.

CAPT Maxfield Receives Commendation. CAPT D. L. Maxfield DC USN, on duty at the Naval Air Station, Quonset, R. I., recently received a letter of commendation from the Commander Fleet Air Quonset for his part in the Quonset-Davisville United Fund Campaign. As Chairman of the Combined Drive, CAPT Maxfield by his tireless efforts was instrumental in helping to attain an 11% increase in per capita contribution over the previous record.

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RESERVE**SECTION****Requirements Modified for Officer Promotion**

New regulations, approved by SecNav, will soon require that all officers on inactive duty—including captains—earn an average of 12 promotion points for each year in grade in order to be eligible for consideration for promotion. These promotion points must be earned before the beginning of the fiscal year in which an officer is in the established promotion zone or otherwise eligible for promotion. However, no officer will be required to earn more than 72 promotion points.

The new requirement is in addition to the regulation that an officer be in an active status.

As a further requirement, officers who are selected for promotion will be given only one fiscal year—following the fiscal year in which selected—to qualify for promotion. Currently, officers have a two-year period in which to qualify.

The promotion point requirements for accepting appointment are unchanged.

The new requirements are expected to stimulate greater participation in the Reserve program.

The change in policy will become effective on 1 July 1961 for eligibility for consideration by fiscal year 1962 and subsequent selection boards. Exemptions from the promotion point requirement are as set forth in BuPers Inst. 1412.1D. (The Naval Reservist, January 1960)

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Recognition and Treatment of Diving Casualties

Recognition and Treatment of Diving Casualties is a two-week active duty for training course which will convene at the U. S. Naval School for Deep-Sea Divers, U. S. Naval Weapons Plant, Washington, D. C., 18 July 1960.

This course offers didactic training in underwater physiology, and in recognition and treatment of casualties associated with any kind of diving. Instructions will include lectures and demonstrations of the equipment of the Deep-Sea Divers School and Experimental Diving Unit. This course is given for active duty personnel enroute to stations where there is some diving activity; however, vacancies in the course may be filled by Reservists on active duty for training.

Inactive Naval Reserve Medical and Medical Service Corps male officers are eligible to attend. All continental naval districts have been allocated quotas.

Since BOQ accommodations and messing are available on a first-come first-served basis, trainees should furnish the Officer in Charge, BOQ, Naval Station, Anacostia, Washington, D. C., advance notice of the date and time of their arrival to report for this duty. Security clearance is not required.

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Active Duty for Training in Military Entomology

A two-week course in Military Entomology, presented by the Armed Forces Pest Control Board, will convene at the Naval Medical School, NNMC, Bethesda, Md., 11 - 23 July 1960. This course in advanced Military Entomology for members of the military services presents the nature of entomologic problems which confront the Armed Forces and which stimulate basic and applied scientific research.

Inactive Naval Reserve Medical Service Corps officers whose specialty is entomology are eligible to attend. Quotas have been allocated to the First, Fifth, Eighth, Eleventh, Twelfth, and Thirteenth Naval Districts. It is anticipated that a total of 30 attendees from the three Services will be present. Interested eligible officers should submit requests to their respective commandants at the earliest practicable date in order that all allocated quotas may be utilized.

Messing and BOQ facilities are available. Security clearance is not required.

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AVIATION MEDICINE DIVISION



Artificial Respiration

For years, we have been teaching in first-aid classes certain methods of artificial respiration. The Schafer (prone-pressure) method of artificial respiration was, a few years ago, replaced by the arm-lift method. Recent reports from the Walter Reed Army Institute of Research have clearly demonstrated that none of these methods can approach in effectiveness the concept

of mouth-to-mouth exchange of respiratory air. This has been clearly demonstrated in a 40-minute research film entitled "Artificial Respiration, Mouth-to-Mouth" which may be obtained on loan by addressing: Research Films, Walter Reed Army Institute of Research, Washington 12, D. C. The film shows that the exchange of air in a victim's chest by various methods of compression of the chest by the rescuer accomplishes little more than the exchange of tidal air. This was so even when the artificial respiration maneuvers were carried on by trained operators. By properly employing the mouth-to-mouth resuscitation maneuver, as much as 2,000 ml. greater aeration was accomplished. This method can be instituted immediately without equipment, but it does require that the resuscitator hold the nostrils with one hand, hold the head well back in extension, and with the other hand hold the jaw and lips open. The resuscitator must make tight contact with his lips over the lips of the victim. More acceptable to the rescuer and, in fact, more effective is the use of mouth-to-mouth airway resuscitation based on the same principle. Use of this method of resuscitation is highly recommended. (CAPT J. T. Smith, Staff, ComNavAirLant)

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Low Pressure Chamber - "Old Stuff"

In teaching the Refresher Physiological Training Course, where the students are well qualified personnel on flying status who have previously had physiologic training, the instructor is confronted with the problem of "old stuff."

A few students come to class with the idea that they do not need this training. Naturally, the material is pretty old to the instructor, and if he feels the same way as the students, the instruction is certainly going to end up as "old stuff" or worse. The students will quickly be convinced they were right, and the end result will be a noneffective course of little value to the students. The one to blame is the instructor. The feeling of the students is understandable, but there is no excuse for the instructor's attitude.

Reports of accidents and near accidents continually indicate the need for more effective refresher physiologic training for all flying personnel. The instructor, therefore, cannot make this instruction a routine quick briefing affair. He has to work harder on a refresher course than on an original course because of the students' approach to refresher training. The instructor presenting a refresher lecture must be enthusiastic and present his material in an interesting well-organized manner. The use of a chamber flight as part of the refresher training also must not be considered a routine affair. Carefully planned learning situations can be provided in the chamber which will permit the chamber to be utilized for the purpose for which it was designed—training.

If the lecture and chamber flight are interesting and well-organized, the refresher training will not be "old stuff." (Smith W. Ames, Ph. D., USAF, SGO)

Full Pressure Suit Evaluation

From 18 March to 31 August 1959, a series of tests was conducted by Air Development Squadron Three (VX-3) to evaluate comparatively the B. F. Goodrich MK IV and the Arrowhead Products AX8 full pressure flight suits, and to evaluate associated support equipment. One hundred and ninety-four sorties were flown in F8U-1, F8U-2, and F4D-1 aircraft to determine the compatibility of these suits with current high performance carrier type aircraft.

Both suits protect the pilot against explosive decompression and loss of cabin pressure by maintaining pressure on the body equivalent to 35,000 feet while flying above that level. The suits are normally only slightly inflated by ventilation air when worn in a pressurized cabin.

The sorties flown included day and night intercepts and tactics, instruments, formation, carrier operations, and simulated combat. High altitude flights with the suit pressurized were conducted up to 56,000 feet indicated altitude. Seven F4D and one F8U flame-outs occurred above 50,000 feet during the project. The pressure suits functioned as designed in all cases. Both suits are satisfactory for service use.

Outstanding features of the Arrowhead suit are: the double zipper entry, ventilating system, and the convoluted shoulder and elbow joints. The two-ply construction of the Goodrich suit is superior to the single layer of the Arrowhead suit.

The face curtain extension installed in the project F4D-1 aircraft is not acceptable for pilots with a torso height of 38 inches or over. This extension is necessary so that the ejection curtain handle can be grasped with the suit pressurized.

High performance aircraft to be flown operationally with full pressure suits must provide control of pressure suit ventilating air temperature independent of the normal cockpit-defrost air temperature control.

An adequate pressure suit ventilating air source for use by pilots prior to flight should be provided in the form of certain ground support equipment. The following units are satisfactory and recommended for full pressure suit operations: A. J. Sawyer Portable Ice Cooled Ventilating Unit and the Hottel Air Conditioned Flight Line Taxi.

The Onan Kab Cooler mounted on a Metro truck is unsatisfactory. No ventilating air for the suit is provided and the unit is not adequately air conditioned.

The compressed air ventilating system installed in the VX-3 ready room at NAS Oceana and aboard USS INDEPENDENCE (CVA-62) is adequate. This source of ventilation air is used by pilots standing by in the ready room.

The ship service low pressure compressed air system on our attack carriers can easily be adapted to provide ventilating air to pilots on the flight

deck. This air should be refrigerated for use by pilots while maintaining Combat Air Patrol condition watches on the catapults. (Abstract: Final Report on Project OP/V258/J26-2 by COMOPTEVFOR)

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Medical Officers for Project Mercury

Six Navy Medical officers have been selected to join with six Medical officers from the Army and eleven from the Air Force to man the tracking and monitoring stations for Project Mercury. All officers selected will receive the same training and more than likely will all take part in the operation when it is activated. The training will consist of approximately 30 days broken up into 7 to 10-day periods between March and October 1960. Training sessions will be held at the National Aeronautics and Space Administration Laboratory, Langley, Va.; the Air Force Missile Center, Cape Canaveral, Fla.; The Navy Aviation Medical Acceleration Laboratory, Johnsville, Pa.; and the Navy Air Crew Equipment Laboratory, Philadelphia, Pa.

The trainees will not be required to be on their stations except for the actual orbital flights when they occur. The naval personnel selected are: CAPTs Carl E. Pruett, Edward L. Beckman, and Walton L. Jones; LCDRs Frank H. Austin, Jr., and John J. Gordon; and LT Glenn F. Kelly.

At the same time these primary selectees are being trained, there will be an opportunity provided for a limited number of residents in aviation medicine to receive the same training. This is in anticipation that younger men ultimately will be needed for manned space operations following Project Mercury. Three Navy aviation medicine residents have been nominated for this training opportunity, all currently in residency training at Pensacola, Fla.

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Aeromedical Evacuation Via MATS

Some misunderstanding attends the operation of MATS under the industrial funding system, particularly as it relates to the aeromedical evacuation of non-Armed Forces patients. It will help to clarify the matter to keep in mind that MATS does not authorize transportation—it provides it.

Because of the possibility of misunderstanding, MATS Aeromedical Evacuation Control Centers have been instructed to aid and assist the hospitals with which they deal in interpreting the requirements and advising them of doubtful areas concerning authorization of patient transportation. However, the Centers have specific instructions not to refuse transportation to any patient on purely administrative grounds. They may advise a hospital commander that a given patient's movement does not appear to be adequately

authorized under current procedures. When they do so, hospital commanders should understand the Centers are offering advice only, and are not refusing to provide transportation. This assuredly will be provided on the basis and under the priorities established by competent medical authority. Ultimately, however, administrative details must be ironed out. Thus, MATS will move patients as requested, then claim reimbursement in due course.

Under the industrial funding concept, all traffic moved aboard MATS industrially funded aircraft—except certain space-available passengers—is reimbursable. Either a fund citation or the name of the individual, organization, or agency responsible for reimbursement must be provided in the orders covering travel by MATS.

As this relates to aeromedical evacuation, the U.S. Air Force reimburses MATS for the movement of all Armed Forces patients. When authorizing movement of Armed Forces patients by MATS, competent medical authorities do not need to cite funds for movement. Headquarters MATS will take care of details of reimbursement in these cases. (The term "Armed Forces patients" is defined in paragraph 2f(8) of the Interim Instructions for the Movement of Traffic by the Single Manager Operating Agency for Airlift Service (MATS), dated 1 June 1958, as amended. These interim instructions stand in lieu of the triservice directive designated as AFR 76-15/AR96-25/OPNAVINST 4630.12.)

The chief area of misunderstanding, however, appears in connection with non-Armed Forces patients. These patients must be sponsored by competent authority of one of three military services, or by the Department of Defense, upon recommendation of competent medical authority. MATS must be reimbursed by either (1) the sponsoring military service, (2) the Department, agency, or institution having responsibility for the patient, or (3) by the patient himself. (The sponsoring military service generally determines which is applicable.) Thus, the use of such terms as "space available - no expense to the government," is no longer appropriate in orders covering aeromedical evacuation of these patients.

What constitutes adequate authority for aeromedical evacuation of non-Armed Forces patients? We accept a valid set of orders or other travel authorization issued by, or approved for, issue by competent military authority in which a fund citation or other information concerning responsibility for reimbursement is specified. This provides sufficient authority insofar as MATS is concerned, based upon which movement will be accomplished without question.

In providing the required authorization, the "competent authority" does not have some restrictions as imposed by the Interim Instructions. These generally concern whom he may authorize and under what circumstances. Because of the range of personnel types eligible for the concern of the military Medical Services, however, the Interim Instructions do not cover every type of case in detail. When questions arise concerning the eligibility of

non-Armed Forces patients, the best course is for the hospital commander at point of origin to query higher headquarters through command channels.

Some individuals appear to have felt that the cite number furnished by the Armed Services Medical Regulating Office constituted adequate authorization for movement of patients by MATS. As we see it, ASMRO does not authorize transportation. They determine bed availability and designate the destination hospital. Thus, neither MATS nor ASMRO authorizes transportation of patients. This authority to provide aeromedical evacuation to or from the hospitals cited by ASMRO stems basically from military commanders at all echelons. These commanders must be guided in turn by the Interim Instructions and their own departmental directives. This is the reason for recommending resort to command channels when in doubt as to whether to authorize movement of non-Armed Forces patients by MATS aeromedical evacuation channels. (USAF Medical Service Digest, X:VIII, August 1959)

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The 1960 Aerospace Medical Association Meeting

The Aerospace Medical Association will hold its 31st annual meeting at the Americana Hotel, Bal Harbour, Miami Beach, Fla., 9, 10, and 11 May 1960. COL James B. Nuttall USAF MC will direct the Scientific Program which will consist of approximately one hundred (100) professional papers, including sponsored sessions by the Dade County Medical Association, the American College of Preventive Medicine, the Armed Forces-National Research Council Committee on Bio-Astronautics, the Joint Committee on Aviation Pathology, the Civil Aviation Medical Association and the National Aeronautics and Space Administration. In addition, there will be a continuous film showing on appropriate subjects presented by the British, Canadians, and Armed Services of the United States. It is anticipated that the scientific and technical exhibits will be the best in recent years.

The Wives' Wing of the Association is developing an extremely attractive program for the ladies and is expecting an excellent attendance. Bring your wife to join in the program of the Wives' Wing and let her have a wonderful vacation at Miami Beach.

It is hoped that government air transportation for many active duty flight surgeons can be made available. All flight surgeons and allied scientists are urged to attend this meeting. Here you will have an opportunity to see more friends than at any other time. Reserve officers may receive retirement point credits for attending this meeting.

Plan to come and bring your wife. This will be the best meeting of them all.

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Pre-Printed Findings on Flight Physical Examinations

Aviation flight physical examinations are being received in the Bureau of Medicine and Surgery with the following examination findings pre-printed: temperature, visual acuity, color vision, depth perception, field of vision, intraocular tension, hearing, and the flight surgeon's recommendation in Item 77 regarding the actual control of aircraft. These findings are pre-printed on the Standard Form 88 prior to actual examination.

The Manual of the Medical Department, article 15-73 states, "the results of the examination shall be typewritten and the original and one copy of the Standard Form 88 forwarded to the Bureau of Medicine and Surgery." It is felt that when the examination is done, the actual findings should be recorded at this time. It is also considered to be better practice to enter the factual findings in the blank spaces rather than in spaces with the pre-printed findings which must be marked out and the actual findings entered in their places when abnormalities are found at the time of the examination.

When the examination findings are pre-printed on the Standard Form 88, there is a tendency to leave entries "normal", particularly when slight abnormalities are found. There is considerably more likelihood of error when Standard Forms 88 with pre-printed findings are used.

Considerable time and effort were consumed in designing the current Standard Form 88 and Standard Form 89, and the consensus is that the forms as designed serve the purpose well and with uniformity for all services and types of examinations.

One area where considerable time may be saved in the preparation of the examination report for forwarding to the Bureau of Medicine and Surgery is in Item 77 where an abbreviated endorsement may be used as follows: "PQ & AA DIACA SG ____" in lieu of the completely typed endorsement, "Is physically qualified and aeronautically adapted for duty involving the actual control of aircraft Service Group ____." This abbreviated endorsement may also be adapted for use in the case of temporarily or permanently disqualified Class I personnel as follows: "NPQ DIACA SG I", "PQ & AA DIACA SG II" (or III as the case may be) or "NPQ DIACA at this time. Rec re-exam ____ months," or "NPQ DIACA Perm." This endorsement may also be adapted for use for Class 2 personnel by substituting "DIF" (duty involving flying) for "DIACA" (duty involving the actual control of aircraft). These abbreviated aviation endorsements are acceptable to the Bureau of Medicine and Surgery.

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CAPT Hunley Assigned to BuMed

CAPT Henry C. Hunley, Jr., MC USN has recently reported to the Bureau of Medicine and Surgery for duty. He has been assigned as Deputy

Director, Aviation Medicine Operations Division (Code 51A) and Head, Aviation Medicine Plans and Personnel Branch (Code 514). This assignment was previously held by CAPT W. Melvin Snowden MC USN.

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Forwarding Reports of Physical Examinations

Official submission of reports of physical examinations (SF 88 or 89) should be addressed to the Chief, Bureau of Medicine and Surgery without reference to a bureau code. Follow-up correspondence submitted at the specific request of Code 511 should be forwarded to that code. Compliance with the above will permit more expeditious review of these reports.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, 19 June 1958.

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